

Appl. No.: 10/757,751  
Amdt. Dated: February 2, 2005  
Reply to Office Action of: November 2, 2004

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**REMARKS/ARGUMENTS**

**1. Restriction Requirement**

The Examiner issued a Restriction Requirement identifying the following groups of claims as being drawn to potentially distinct inventions:

Group I. Claims 1 - 9, drawn to a method, classified in class 117, subclass 81 and

Group II. Claims 10 - 12, drawn to a product, classified in class 423, subclass 462

The Examiner asserted that these inventions may be regarded as independent and distinct from one another because the process can be used to make another materially different product and the product can be made by another materially different process.

In a telephone conference on October 27, 2004 with the undersigned attorney/agent of record, a provisional election to Group I, claims 1- 9, was made without traverse. Applicants hereby confirm that provisional election, without traverse.

**II. Claims**

Claims 1-5 and 7-9 remain in this application. Claims 1, 4, 8 and 9 has been amended. Claim 6 has been cancelled. Claims 10-12 have been withdrawn as a result of an earlier restriction requirement. In view of the examiner's earlier restriction requirement, applicant retains the right to present claims 10-12 in a divisional application.

Claim 1 has been amended to recite that the temperature difference between the two zones is less than 50 °C, and that the substantially constant cooling rate is less than 3 °C.

Claim 4 has been amended to recite that the temperature difference between the two zones is less than 30 °C. Support for this amendment is found in Paragraph [0020] on page 6, lines 8-9.

Claims 8 and 9 have been amended to remove their dependency on claim 6 which has been cancelled herein.

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### III. Specification

The Examiner has indicated various informalities or typographical errors in the specification, which have been corrected above as appropriate. Claim 1 has been amended to recite "strontium fluoride".

Claim 4 was also cited as being indefinite. Applicants traverse this rejection. Applicants believe that the Examiner may have misunderstood a portion of claim 4 in view of the specification and what is recited in claim 1.

Claim 1 recites in part:

"... growing a fluoride crystal from the fluoride melt by cooling the melt from the melting temperature to a first temperature below the melting temperature by lowering the melt from the melting zone into the cooling zone and controlling the temperature of the two zones so that the temperature difference between the two zones is minimized during crystal formation ..."

Claim 4 recites:

"The method according to claim 1, wherein during crystal growth and cooling to a first temperature the temperature difference between the two zones is less than 50 °C."

These two claims need to be read and understood in view of the Specification, Paragraph [0020], as shown on page 6 beginning at line 2 and continuing to the end of the paragraph.

One skilled in the art, after reading the paragraph would understand that in practicing the invention one removes the crucible from the melting (hot) zone to the cooling (cold) zone while keeping the temperature difference between the zones to 50 °C or less. Reference is made to Figure 2 which shows at the upper left that the hot zone is cooled at a faster rate than the cold zone. However, as stated in the Paragraph [0020], this difference is done in a manner such that the cooling curves for both zones are as smooth as possible while maintaining the difference. During this stage the crystal is grown from the melt. The cooling under this regime, that is, under the 50 °C difference

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criterion, continues until the crystal is grown and the temperature reach the First Temperature of 1100-1300 °C. To do this, the temperature of both zones is continuously lowered. One the First Temperature is reached, then entire crystal, which is now in the cooling zone, is then cooled at a substantially constant rate to a final temperature.

Stated another way, the melting point of  $\text{CaF}_2$  is 1420 °C and at temperatures below this a  $\text{CaF}_2$  melt will crystallize. Using the teachings of the invention, one skilled in the art would understand that in the process one maintains the hot zone above the melting point and cold zone below the melting point so that crystallization can be effected, the temperature difference between the two being 50 °C or less. When the crystal has been grown from the melt, the temperature of the two zones is then lowered to the First Temperature, but the temperature difference between the two is maintain at 50 °C or less until the First Temperature is reached.

Therefore, applicants respectfully submit that in view of the foregoing explanation, based on the Specification and Figures, claim 4 as it presently is stated is not indefinite; and applicants respectfully request that the Examiner withdraw the rejection..

#### IV. § 102 Rejections

The Examiner has rejected claims 1, 2, 3, 5, and 6 under 35 U.S.C. § 102(b) as being anticipated by Garibin, et al (US 2002/018057). Applicants traverse the rejection and submit that it is moot in view of the amendment to claim 1. Claim 1 is the independent claim. Claims 2, 3 5 and 6 depend on claim 1.

Claim 1 has been amended to recite the use of a constant temperature cooling rate from the first temperature to a final temperature and that this constant rate is 3 °C or less. In addition, claim 1 has been amended to state that the temperature difference between the hot and cold zones is less than 50 °C.

Garibin et al. teaches multiple cooling rates from "first temperature" to a final temperature. (See Paragraphs [0015] and claim 3.) Further, Garibin does not teach or suggest the application of a constant or linear cooling rate from the first temperature a final temperature. In addition, Garibin does not teach maintaining the temperature difference between the hot and cold to less than 50 °C. Consequently, applicants

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respectfully submit that Garibin does not anticipate the claimed invention as claimed in claim 1, and consequently in claims 2, 3, 5 and 6 which depend on claim 1

Therefore, in view of the amendment to claim 1, applicants respectfully submit that it is proper for the Examiner to withdraw the §102(b) rejection of claims 1, 2, 3, 5 and 6.

**V. § 103 Rejections**

**A.** The Examiner has rejected claims 1 - 5 and 7 - 9 under 35 U.S.C. § 103(a) as being unpatentable for obviousness over Garibin, et al (US 2002/0185057) as applied to claims 1, 2, 3, 5, and 6 above and further in view of Sakuma, et al (US 2002/0038625) for reasons stated in the Office Action. Claim 1 is the independent claim. Claims 2 - 9 depend on claim 1. Applicants traverse the rejection in view of the amendment to claim 1.

Claim 1 has been amended to recite the use of a constant temperature cooling rate from the first temperature to a final temperature and that this constant rate is 3 °C or less. In addition, claim 1 has been amended to state that the temperature difference between the hot and cold zones is less than 50 °C. Garibin et al. teaches multiple cooling rates from "first temperature" to a final temperature. (See Paragraphs [0015] and claim 3.) Further, Garibin does not teach or suggest the application of a constant or linear cooling rate from the first temperature a final temperature. Consequently, applicants respectfully submit that Garibin does not anticipate the claimed invention as claimed in claim 1, and consequently in claims 2, 3, 5 and 6 which depend on claim 1

Sakuma likewise does not teach or suggest the use of a constant or linear cooling rate from a first temperature to a final temperature. Further, Sakuma does not teach growing a crystal from a melt while maintaining the temperature difference between the hot and cold zones to 50 °C or less. In fact, Sakuma does not even mention growing a crystal, but instead starts with crystal that is that has been grown in a previous process. Consequently, applicants submit that Sakuma does not, in combination with Garibin, teach or suggest the claims invention which is directed to

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a one-step process for growing and annealing a crystal as taught by applicants' amended claims.

Therefore, in view of the foregoing facts and arguments, and the amendment to claim 1, applicants respectfully submit that it is proper for the Examiner to withdraw the §103(a) rejection of claims 1-9.

- B. The Examiner has rejected claims 1 - 5 and 7-9 under 35 U.S.C. 103(a) as being unpatentable over Price (US 2002/0066402) in view of Sakuma, et al (US 2002/0038625) for reasons stated in the Office Action. Claim 1 is the independent claim. Claims 2 - 5 and 7 - 9 depend on claim 1. Applicants traverse the rejection.

Price does not teach or suggest the growing of a crystal while maintaining the temperature difference between the hot and cold zone to less than 50 °C. In addition, Price does not teach or suggest the use of a constant or linear cooling rate for a crystal from a first temperature to a final temperature.

Sakuma likewise does not teach or suggest the use of a constant or linear cooling rate from a first temperature to a final temperature. Further, Sakuma does not teach growing a crystal from a melt while maintaining the temperature difference between the hot and cold zones to 50 °C or less. In fact, Sakuma does not even mention growing a crystal, but instead starts with crystal that is that has been grown in a previous process. Consequently, applicants submit that Sakuma does not, in combination with Price, teach or suggest the claimed invention which is directed to a one-step process for growing and annealing a crystal as taught by applicants' amended claims.

Therefore, in view of the foregoing facts and arguments, and the amendment to claim 1, applicants respectfully submit that it is proper for the Examiner to withdraw the §103(a) rejection of claims 1-5 and 7-9.

- C. The Examiner has further rejected claims 1 - 5 and 7 under 35 U.S.C. 103(a) as being unpatentable over Shiezawa (US 2001/0019453) in view of Sakuma, et al

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(US 2002/0038625). Claim 1 is the independent claim. Claims 2 - 5 and 7 - 9 depend on claim 1. Applicants traverse the rejection.

Shiozawa does not teach or suggest the growing of a crystal while maintaining the temperature difference between the hot and cold zone to less than 50 °C. In addition, Shiozawa does not teach or suggest the use of a constant or linear cooling rate for a crystal from a first temperature to a final temperature.

Sakuma likewise does not teach or suggest the use of a constant or linear cooling rate from a first temperature to a final temperature. Further, Sakuma does not teach growing a crystal from a melt while maintaining the temperature difference between the hot and cold zones to 50 °C or less. In fact, Sakuma does not even mention growing a crystal, but instead starts with crystal that is that has been grown in a previous process. Consequently, applicants submit that Shiozawa does not, in combination with Sakuma, teach or suggest the claimed invention which is directed to a one-step process for growing and annealing a crystal as taught by applicants' amended claims.

Therefore, in view of the foregoing facts and arguments, and the amendment to claim 1, applicants respectfully submit that it is proper for the Examiner to withdraw the §103(a) rejection of claims 1-9.

#### VI. Double Patenting

Claims 1-5 and 7 - 9 are provisionally rejected under the judicially created doctrine of double patenting over claims 1 - 22 of co-pending Application No. 10/652,013. This is a provisional double patenting rejection since the conflicting claims have not yet been patented.

Applicant will provide a Terminal Disclaimer for the present application in the event that co-pending Application No. 10/652,013 is allowed and/or has issued prior to the allowance of the present application.

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**VII. Art cited but not relied on.**

Applicants have reviewed that art cited and not relied on and believe that this art neither anticipates nor teaches or suggests applicants' invention as claimed in the amended claims submitted herewith.

**VIII. Conclusion**

Based upon the above amendments, remarks, and papers of records, applicants believes the pending claims of the above-captioned application are in allowable form and patentable over the prior art of record. Applicants respectfully request that a timely Notice of Allowance be issued in this case.

Applicant believes that no extension of time is necessary to make this Reply timely. Should applicant be in error, applicant respectfully requests that the Office grant such time extension pursuant to 37 C.F.R. § 1.136(a) as necessary to make this Reply timely, and hereby authorizes the Office to charge any necessary fee or surcharge with respect to said time extension to the deposit account of the undersigned firm of attorneys, Deposit Account 03-3325.

Please direct any questions or comments to Walter M. Douglas at 607-974-2431.

2 February 2005  
Date

<p><b>CERTIFICATE OF TRANSMISSION</b> <b>UNDER 37 C.F.R. § 1.8</b></p> <p>I hereby certify that this paper and any papers referred to herein are being transmitted by facsimile to the U.S. Patent and Trademark Office at 703-872-9306 on:</p> <p><u>2 February 2005</u> Date</p> <p><u>Walter M. Douglas</u> <u>2 Feb 2005</u> Walter M. Douglas Date</p>
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Respectfully submitted,  
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